

November 12, 1868.

Professor Alfred Newton, F.Z.S., in the Chair.

Mr. P. L. Sclater read notices of the more important additions made to the Society's Menagerie during the months of June, July, August, September, and October, amongst which were:—

1. A pair of the beautiful Green Hunting-Crow of Northern India (*Cissa venatoria*), purchased June 2nd, and believed to be the first two examples of this form received alive in Europe.

2. An Australian Fruit-Bat (*Pteropus poliocephalus*, Temminck), from New South Wales, presented by H.R.H. the Duke of Edinburgh, July 4th.

3. A young male Koodoo Antelope (*Strepsiceros kudu*), purchased July 16th out of a large collection of living animals made by M. Casanova in the vicinity of Casala, Lower Nubia.

4. A young female of the Spanish Ibex (*Capra pyrenaica*, Schimper), presented by Major Howard Irby, August 10th, being the specimen alluded to *antea*, p. 403. Another correspondent of the Society had promised to supply a male of this interesting species.

5. A very fine young female of the Hoolock Gibbon (*Hylobates hoolock*), presented by Mr. A. Grote, F.Z.S., August 14th, who had communicated the following note respecting this animal:—

“This Hoolock was sent to me early in 1867, by Mrs. Driver, of Gowalpara, a civil station on the western border of the Assam province. The animal is common in the jungles of the Gowalpara district, on the left bank of the Barhampooter; and its young are frequently captured by the natives and brought into the station, though, being impatient of confinement, they are not usually, so far as I can learn, kept alive for any time. Those which are sent down to Calcutta seem very sensitive to the change of climate, and are generally carried off by pulmonary disease. The individual which I brought home was attacked within a week of her reaching me at Alipore, and would probably have succumbed but for the unremitting attention of Dr. John Anderson, the Society's agent in Calcutta, to whom I had made her over. She was for more than a year in the Botanic Gardens, and, being allowed a good deal of liberty there, kept her health very well. She has grown considerably since she was first sent down to me.

“Both this species and the *Hylobates lar* of Tenasserim are exceedingly gentle, and rarely, if ever, bite in anger. There is a good account of an individual of the latter species by Mr. H. Blanford in a recent number of the ‘Journal of the Asiatic Society of Bengal.’ It differs in external appearance from the Gibbon in having a whitish-grey fringe round the face, and is incapable of shouting. The Hoolock owes its native name to its loud and peculiar voice.”

6. A specimen of the Large White Crane of Upper India (*Grus leucogeranos*), presented by the Babu Rajendra Mullick, of Calcutta, C.M.Z.S., August 14th.

7. A young female Sea-Lion (*Otaria jubata*), from the Falkland Islands, received August 24th.

This individual was the only survivor of eight examples of this animal captured in various spots on the coast of the Falklands by Adolphe Alexandre Lecomte, the Society's keeper, who had been sent out there by the Council of the Society for the purpose of obtaining living specimens of it.

Lecomte left Swansea on the 1st of June, 1867, in the coal-ship 'Epsilon' (Capt. Williams), and arrived at Port Stanley on the 11th of August. The first fortnight after his arrival he devoted to excursions along the shores in the vicinity of Port Stanley, but found little of interest here except Upland Geese (*Chloëphaga magellanica*), Kelp Geese (*C. antarctica*), and other birds, and a single Sea-Leopard (*Stenorhynchus leptonyx*) shot in a remote part of Stanley Harbour, being the only specimen of this animal met with during his stay in the Falklands. In the middle of September Lecomte went to Capt. Packe's establishment at Island Harbour, and stayed there a month, searching the creeks and shores diligently in that vicinity. "Elephant Island," in this neighbourhood, so called from the former abundance there of the Sea-Elephant (*Morunga proboscidea*), was found to be quite deserted by this animal, which is said to be now entirely extinct in the Falklands, though its former abundance in certain spots is well known, and is further testified by remains of its bones and teeth met with on the shores, specimens of which were obtained and brought home. In December Lecomte returned to Port Stanley, where Governor Robinson most kindly gave him a room in Government House whilst engaged in preparing specimens and prosecuting researches for the Society. His Excellency likewise allowed him the use of a schooner of eight tons burden, in which he made several voyages to Volunteer Lagoon and the adjoining shores of East Falkland. This was in the month of December, when the various species of Penguins are most easily captured. On the north shore of East Falkland, to which he crossed from Volunteer Lagoon, Lecomte found a large "rookery" of Gentoo Penguins (*Pygosceles wagleri*); amongst them were about twenty King-Penguins (*Apterydytes pennantii*). Lecomte captured about a dozen individuals of each of these species, and about the same number of the Rock-hopper Penguin (*Eudyptes nigrivestis*, Gould), Macaroni-Penguin (*E. chrysolophus*), and Jackass Penguin (*Spheniscus magellanicus*), all of which were assembled together at Port Stanley at the end of December 1867. Lecomte remarked that the Macaroni-Penguin does not constitute rookeries of its own, but is found sparingly mixed up among the Rock-hoppers in certain localities. But at Eagle Point, where there is a large rookery of Rock-hoppers (consisting of, perhaps, 40,000 birds), not a single Macaroni was found. He likewise noted that the Jackass Penguin differs entirely from the other species in its method of breeding, as it lays its egg at the end of a deep burrow (sometimes 20 feet from the orifice) which it excavates near the sea-shore\*.

\* Cf. Capt. Abbott's notes in 'The Ibis,' 1860, p. 336, et 1861, p. 163.

About the 9th of January last, Lecomte again left Port Stanley in the Governor's schooner for Port Salvador, at the northern extremity of East Falkland. On this as on other occasions, on passing the "Volunteer Rocks," the Fur-Seal of the Falklands (*Otaria falklandica*) was seen in considerable numbers. On a fine day, by the aid of a glass, some 100 or 150 of this Seal may be distinguished lying on these rocks; but the violence of the surf renders it impossible to approach them in a small schooner. On reaching Port Salvador the numerous inlets were diligently searched for Sea-Lions, but here, where these animals were formerly so abundant, not one was met with. Lecomte next tried the vicinity of Island Harbour, on the east coast, but was again unsuccessful, only meeting with a single example of this species. Returning to Port Stanley he found the stock of Penguins required replenishing, and made another visit to Volunteer Lagoon for this purpose.

About the beginning of March, Lecomte left Port Stanley again in the Governor's schooner for "Sea-Lion Island," off the south shore of East Falkland, with the expectation of here, at least, meeting with the animal whence the island has received its name. But he was again disappointed, not a single Sea-Lion having been found in this locality. But on the southernmost of the Kelp Islands, lying further north, which were visited on the return voyage, a herd of about thirty individuals of this animal was discovered; an old male (of which the skull was preserved) was shot, and four young ones (two males and two females) were captured. The female Sea-Lion produces her young (rarely more than one at a birth) about Christmas-day; so that these animals were between three and four months old when captured. Lecomte returned at once to Port Stanley with his captives, but found much difficulty in rearing them. The supply of milk was limited; and small fishes, such as they could eat, were with difficulty to be had. The last of the four died upon Good Friday (April 10th), whereupon he immediately determined to set about getting a fresh supply.

The Governor's schooner being now employed upon other service, Lecomte hired for this purpose the schooner 'Felis' (Capt. Hansen), a vessel of about 20 tons, usually engaged in the Penguin and Seal fishery\*, and left Port Stanley on May 23rd. At Kelp Island, the first spot visited, they could not land, from bad weather, but Sea-Lions were observed with the glass. On the 30th of May they were on Great Island in Adventure Bay, and here succeeded in capturing the only two Sea-Lions met with, both of which were young females. On the 8th of June two others (one male and one female) were taken at North Point Island, off the same coast, the female being that which is now in the Society's Gardens; and Lecomte immediately returned with all four of them to Port Stanley.

From Port Stanley Lecomte proceeded home by the packet 'Fawn,'

\* Four vessels engaged in this trade at Port Stanley last year are stated to have made altogether 50,700 gallons of Penguin oil. The destruction thus caused amongst these birds may be realized when it is considered that eight Penguins are estimated to make one gallon of oil.







which meets the mail-steamer at Monte Video, with the following living animals:—

- 4 Sea-Lions (*Otaria jubata*).
- 1 Gentoo Penguin (*Pygosceles wagleri*).
- 4 Rock-hopper Penguins (*Eudyptes nigrivestis*).
- 6 Kelp Geese (*Chloëphaga magellanica* and *C. antarctica*).
- 9 Logger-headed Geese (*Micropterus cinereus*).
- 8 Johnny Rooks (*Milvago australis*).
- 7 Cormorants (*Phalacrocorax magellanicus* and *P. carunculatus*).
- 12 Gulls (*Larus dominicanus*, *L. scoresbii*, &c.).
- 6 Starlings (*Sturnella militaris*).
- 22 Finches (*Phrygilus melanoderus*).
- 2 Sea-hens (*Hæmatopus niger*).
- 2 Foxes (*Canis antarcticus*).

But the weather was very unfavourable between Port Stanley and Monte Video, and seventy-one of the animals died *en route*. For some time longer the four Sea-Lions remained in good health and condition; but a passenger having died of yellow fever, the stock of fish shipped for feeding them was condemned on account of its smell and ordered to be thrown overboard. The consequence was the loss of three out of the four Sea-Lions—the survivor having been kept alive as far as Lisbon, when a fresh supply was obtained, mainly by the Flying-fishes (*Exoceti*), which fell on the deck at night and were purchased from the sailors who picked them up.

Besides the Sea-Lion, Lecomte succeeded in bringing to the Gardens only the following animals:—

- 1 Antarctic Wolf (*Canis antarcticus*).
- 2 Forster's Milvago (*Milvago leucurus*).
- 1 Kelp Goose (*Chloëphaga antarctica*).
- 2 Upland Geese (*Chloëphaga magellanica*).
- 1 Dominican Gull (*Larus dominicanus*).

8. A young male African Two-horned Rhinoceros (*Rhinoceros bicornis*), purchased September 11th (see Plate XLI.). This animal, which was believed to be the first individual of the species which had reached Europe alive since the days of the Romans, was purchased for the Society of Mr. Carl Hagenbeck, the well-known dealer of Hamburg. It had been originally captured, on the 12th of February 1868, by the Arabs of the Beni-Ammer tribe, in the vicinity of Casalá, in Upper Nubia, and sold by them to Herr Casanova, an enterprising traveller of Vienna. Pending the completion of the new house for Rhinoceros and Elephants, now in process of erection, this Rhinoceros had been temporarily lodged in the Giraffe House.

9. Two specimens of the Dotted-jawed Cayman (*Jacare punctulata*), obtained in the Island of Tobago and presented to the Society by Capt. Spicer, of the ship 'Mary,' on the 18th of September.

10. On the 14th of October, a selection had been obtained from a series of Chilian and La-Platan animals sent to Europe by the newly established Zoological Society of Santiago, to be disposed of

for the augmentation of their living collection. Amongst these were a Pampas Cat (*Felis pajeros*) from La Plata, four specimens of Cuming's Octodon (*Octodon cumingi*), a Patagonian Parrot (*Conurus patagonicus*), and a young Darwin's Rhea (*Rhea darwini*) from Chili. The three first-mentioned species were novelties to the Society's collection. Of the Darwin's Rhea only one specimen had been previously exhibited in the Society's Menagerie.

11. Two Black-billed Sheath-bills (*Chionis minor*, Hartl.) from the Crozette Islands, presented by E. L. Layard, Esq., F.Z.S., on the 26th of October.

12. A fine specimen of the Aard-Wolf of the Cape of Good Hope (*Proteles lalandii*), purchased by the Society, October 26th, of Capt. W. R. Dixon, of the Cape Mail Company's service, and believed to be the first example of this rare mammal ever brought to Europe alive.

13. An example of the Tuatera Lizard of New Zealand (*Hatteria punctata*), deposited in the Gardens by Sir George Grey, K.C.B., F.Z.S., October 28th. Two living specimens of this most singular of existing Saurians, which had been believed to be nearly extinct\*, had been obtained in the province of Wellington by Dr. Hector, F.R.S., C.M.Z.S., and delivered to Sir George Grey for transmission to this country. One of these had arrived alive, and appeared to be doing well, feeding readily on meal-worms and insect food.

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Letters were read, addressed to the Secretary by H.E. Sir Rutherford Alcock, C.M.Z.S., H.B.M. Minister at Pekin, giving an account of the progress made in his endeavours to obtain for the Society living specimens of *Elaphurus davidianus*. Two pairs of young ones had been obtained from one of the ministers of Yamên, who was the chief custodian of the parks; but, in spite of the care lavished upon them by Mr. R. Swinhoe, three of these had been already lost. Sir Rutherford was now endeavouring to get older animals to replace them.

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Letters were also read, addressed to the Secretary by Mr. R. Swinhoe, now temporarily attached to the embassy at Pekin, upon the same subject. Mr. Swinhoe stated:—

"The *Elaphurus* is known only from the Nan-hai-tsze, a large hunting-park belonging to the Emperor about two miles south of Pekin. They run wild there, and are said to be numerous. No one is allowed to enter the park. The Chinese call this animal the *Sze-poo-seang*, i. e. 'like none of the four'—to wit, the Horse, the Cow, the Deer, and the Goat."

Mr. Swinhoe likewise spoke of a journey he had recently made to the little-known island of Hainan, where he had got together a considerable zoological collection. No Pheasant was met with in the island, but only a Jungle-fowl, which, however, was quite new to him. He had also seen there in confinement the Black-winged Pea-

\* Cf. Günther, Phil. Trans. Roy. Soc. vol. clvii. p. 595.

fowl (*Pavo nigripennis*, Slater\*), and had subsequently ascertained that this was the ordinary species of Cochin-China.

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In reference to the *Elaphurus*, the Secretary announced that the two adult specimens of *Elaphurus davidianus*, which had been presented to the Society at Pekin by Mons. H. de Bellonnet, had died at Pekin before they could be sent to this country; but that the skin and skeleton of one of them had been sent home and safely received. The Council had presented the complete skeleton of this rare mammal, being the first specimen of it that had ever been received in this country, to the Royal College of Surgeons, and the skin to the British Museum. Two pairs of shed horns had been likewise received along with the skeleton, and were exhibited at the Meeting.

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A letter was read, addressed to the Secretary by Mr. Gerard Krefft, C.M.Z.S., dated Australian Museum, Sydney, April 1st, and enclosing some photographs of a large specimen of a Skate of the genus *Cephaloptera*, recently captured near Sydney. The body of this fish, from the snout to the anus, was stated to measure 4 feet 10 inches, and the tail 2 feet 8 inches. The species was believed to be undescribed, and further particulars were promised.

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Mr. Slater read an extract from a letter addressed to him by Dr. W. Peters, F.M.Z.S., in reference to a Pteropine Bat acquired by the Society on the 29th April, 1867, and subsequently deceased. This Bat had been entered in the Society's register as *Pteropus argentatus*, Gray (see P. Z. S. 1867, Appendix, p. 1037). Dr. Peters, to whom the specimen, when dead, had been sent for more accurate examination, had determined it to be *Pteropus hypomelanus*, Temm. (cf. Peters, Monatsb. Berl. Ac. 1867, p. 320), of Ternate. It had been recently ascertained that the true locality of this specimen was not "China" (as given in the Society's Report for 1868, p. 25), but that it had been captured at sea by a vessel coming from China.

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Mr. Slater read extracts from letters received from Dr. R. A. Philippi, C.M.Z.S., dated Santiago, May 30th and July 16th, and containing some remarks upon Mr. Slater's article upon the "Birds of Chili," published in the Society's 'Proceedings' for 1867, p. 319. Of his *Anas iopareia* Dr. Philippi had procured but one specimen, and believed now that it was probably a bastard between the common *Anas* and *Anas moschata*. *Erismatura vittata* he acknowledged was merely the young of *E. ferruginea*, as already suggested by Mr. Slater (*l. c.* p. 336). Some of the birds mentioned in Mr. Slater's list were considered by Dr. Philippi to be not Chilian, such as *Progne*

\* P. Z. S. 1860, p. 221, et 1863, p. 123. See Mr. Darwin's remarks on the interest attached to this species, 'Animals and Plants under Domestication,' vol. i. p. 290.



*furcata* and *Gallinula galeata*, *Sarcidiornis regia*, &c. ; while others were thought by himself and Mr. Landbeck to be mere varieties, such as *Rhynchotus punctulatus*, *Thinocorus ingæ*, *Bubo crassirostris*. Dr. Philippi likewise stated that he was engaged in preparing a Catalogue of the Birds of Chili, copies of which, when complete, would be forwarded.

The following letter, addressed to the Secretary by Dr. J. E. Gray, F.R.S., was read :—

“ British Museum,  
October 26, 1868.

“ MY DEAR SIR,—In Dr. Bowerbank’s Notes on my paper on Sponges in the ‘Proceedings of the Zoological Society’ for 1868, p. 133, I find, among other observations of a like kind, the following passage, which may fairly be cited as a sample of the value of the remainder :—

“ ‘If it is to be tolerated that any naturalist shall get sight surreptitiously of the specimens belonging to another, and then describe, name, and publish them, as in the case of the genus *Astrostoma*, page 514, unknown to the owner, and without permission so to use them,’ &c.

“ It is only necessary to state very simply the facts of the case to show how utterly baseless is this attack on my honour and honesty.

“ In the ‘Philosophical Transactions’ for 1862 Dr. Bowerbank described ‘a specimen of a *branched*\* sponge from the East Indies, presented to me by my friend Mr. S. P. Pratt,’ and on plate 55, figs. 3, 4, 5, 6, he figures the sponge and its oscula. The peculiarities of this sponge and of its oscula having been referred to in the discussion on the structure of *Hyalonema*, I happened one day to be showing the figure to Mr. Tyler at the British Museum, when he informed me that he had part of the original specimen of it, Dr. Bowerbank (as he often did) having given it to him to mount portions of it. Some time afterwards he brought me specimens for examination ; and as I found the oscula to be unlike those of any other sponge, I described it as a new genus, under the name of *Astrostoma*, in the ‘Proceedings of the Zoological Society’ for 1867, p. 514, referring to Dr. Bowerbank’s paper and figures in the ‘Philosophical Transactions.’

“ Dr. Bowerbank, with singular inconsistency, denies that I had seen the original specimen, ‘as that had never passed out of his hands.’ On which statement Mr. Tyler observed to me, when we met, in nearly the same terms as before, ‘that the sponge was given to him to mount, that he made from it several preparations, both in balsam and dry, and that with Dr. Bowerbank’s full knowledge and permission he had, as was his usual custom, kept those which he had shown to me.’

\* “ In a former page of this communication to the Zoological Society, Dr. Bowerbank attacks me in his usual vehement manner for describing this sponge as ‘branched,’ and says that ‘it is a simple unbranched cylinder.’ So loose, inaccurate, and contradictory are his statements in regard to the simplest matter of fact.”



"One of these preparations is so exactly like one of Dr. Bowerbank's figures, that it seems certain they must have represented contiguous slices, merely separated from each other by the knife in cutting them.

"Thus it will be seen that the sponge which I am accused of 'describing without permission' was described and figured in 1862, now six years ago, and had been the subject of discussion by Dr. Oscar Schmidt and others in scientific papers—moreover that, instead of 'surreptitiously getting sight of it,' it was not in any way sought out by me, but that the specimen which I examined was brought to me by its owner, with a view to the elucidation of a subject in which we had a common scientific interest. It is shown also that the sponge which I described *was* part of the *original* specimen, which Dr. Bowerbank in one place denies; while it *was not* surreptitiously got sight of, which, without apparently noticing the contradictory nature of the charge, he asserts in another.

"I should be the last person to object to the utmost possible freedom of discussion; but, nevertheless, I cannot but feel that it should be conducted with decorum and with attention to the feelings and habits of society, and, at all events, with the most careful attention to accuracy of statement. I know well that Dr. Bowerbank is in the habit of using very strong language; but I do not consider it creditable to the scientific character of the Zoological Society that such an attack on one of the oldest and certainly not the least industrious of its scientific Members should have been allowed to appear in its 'Proceedings,' without first informing him of it in order that he might be allowed to show, as I have now done, that the charge is without the shadow of a foundation. I think, too, that such a paper should, at all events, be brought under the special consideration of the Publication Committee before printing; and I am certain that in such cases the authors would be requested, in consideration of the dignity of science, to reconsider many of their statements. Societies very properly decline responsibility for the facts or reasonings of the papers they publish; but the tone and temper of the communications is certainly within their province to decide on.

"I am, my dear Sir,

"Yours sincerely,

"P. L. Sclater, Esq."

"JOHN EDWARD GRAY."

The following papers were read:—

1. Notes on the History and Geographical Relations of the Cetacea frequenting Davis Strait and Baffin's Bay.  
By ROBERT BROWN, F.R.G.S.

[Communicated by Dr. James Murie.]

I conclude these papers on the Mammalia of Greenland and adjoining seas by a few notes on the order more intimately associated  
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in popular imagination with the Arctic regions than any other, viz. the Cetacea. Though much more imperfectly known than any other group, yet my observations on them will be more brief than on the other mammals, and for the same reason which has conduced to the present state of cetology, viz. the want of opportunities of examining the species. These remarks will therefore necessarily consist of a statement of the geographical range and migrations and a description of the habits of the better known, and a list of the species, and whatever information can be collected on these points regarding the others only known by skeletons or remains in museums. These I have examined carefully; and the synonymy given is the result of that study, coupled with investigations made in Greenland. With the exception of a few of the more common, such as *Phocæna communis*, *Beluga catodon*, &c., I have not had an opportunity of examining, otherwise than in the manner indicated, most of the species. I have, however, examined at different times above thirty specimens of *Balæna mysticetus*, and many of *Monodon monoceros*; and to these I have appended various descriptive observations derived from my own examination and without reference to any other published descriptions, which have in nearly every case been only derived from an examination of foetal specimens or isolated individuals, conveying but an imperfect idea of the species. What I said in another memoir equally applies here, viz. that the descriptions are not given as complete, but merely appended as fragments of a *mémoire pour servir*. Those who have attempted the examination of any member of the group Cetacea, and still more those whose lot has been to examine with frozen fingers (plunged every now and again into the warm blood of his *subject*) such an unwieldy object on a swaying ice-floe, will appreciate the difficulty of drawing up such descriptions; and to them no apology is necessary for their imperfection. The absolute necessity of recording every description of the members of this order, however apparently well known, must be my excuse for presenting these notes in such a disjointed state. In the original draft of them I had mentioned various particulars now omitted—the recent reproduction by the Ray Society of the admirable memoirs of Professors Eschricht, Reinhardt, and Lilljeborg rendering the publication of these unnecessary.

#### 1. BALÆNA MYSTICETUS, Linn.

( $\alpha$ ) Popular names.—*Greenland Whale*, *Right Whale*, *Common Whale* (English authors); *Whale*, *Whale-fish*, and “*Fish*” (English whalers). The young are denominated *suckers*, and are also sometimes known by the following names:—*Shortheds* (as long as they continue suckling); *Stunts* (two years); *Skull-fish* (after this stage or until they become *Size-fish*, when the longest splint of whalebone reaches the length of six feet); *Tueqval?* (Norse); *Rhetval* (Danish); *Arbek*, *Arbavik*, *Sokalik* (Greenland); *Akbek*, *Akbeelik* pl. (Eskimo of western shores of Davis Strait); I have also heard both the Greenlanders and western Eskimo call it *puma*, but I cannot learn what is the origin of this word, and suspect it to be *whaler*,—a cor-

rupted jargon of Scotch, English, Danish, and Eskimo, joined with some words which seem to belong to no language at all, but to have originated in a misconception on either side, and to have retained their place under the notion that each party was speaking the other's language, something of the nature of the *Lingua Franca* of the Mediterranean, the *Pigeon English* of China, and the *Chinook jargon* of North-west America.

(β) *Descriptive Remarks*.—The lower surface of the head is of a cream-colour, with about half a foot of blackish or ash-colour at the tip (or what corresponds in the higher orders of mammals to the symphysis) of the lower jaw; further back the colour shades into the general dark blue colour of the body. This colour is generally almost black in adults, but in young ones (or “suckers”) it is lightish blue; hence the whalers sometimes call these “blueskins.” The whiskers consist of nine or ten short rows of bristles, the longest bristles anteriorly. There are also a few bristles on the apices of both jaws, and a few hairs stretching all along the side of the head for a few feet backwards. On the tip of the nose are two or three rows of very short white hairs, with fewer hairs in the anterior rows, more in the posterior. I have reason to believe that some of these hairs are deciduous, as I have often found them wanting in old individuals. In older Whales the darker colour of the body impinges on the under surface of the head, leaving the ordinary white of the suckers merely in the form of several irregular blotches, but with two (regular?) spots, one on each side of the jaw immediately posterior to the eye, composed of a hard cartilaginous material. There is also a little white on the eyelids, and some irregular white markings on the root of the tail. There is likewise a white colour all around the vulva and mammæ. Some individuals may be found quite white on the belly, others piebald, and others with white spots on various portions of the body not mentioned. The presence or absence of a particular white marking on a specimen of a Cetacean under examination ought by no means to be received (as has been done) as a proof that the species is different, or that because such is mentioned in a former description such description is erroneous, because this is one of the most varying characters possessed by the order\*. The inside of the mouth inferiorly, where the tongue is not attached, is of a pale blue colour. The tongue is broader posteriorly, and narrowed anteriorly, paler blue than the rest of the mouth, and pale blue all round the edges and where not carnation, which colour prevails in the form of a streak down the mouth of a deep sulcus on the middle and anterior portion of the tongue, terminating irregularly about two feet from the root of the tongue. The contour of the tongue is entire throughout. The substance of the tongue is a fibrous blubber containing very little oil. There are numerous small linear muscles interspersed through the lower part. The roof of the mouth, on

\* The colour also varies with the age, the back of some being black, of others black and white, and some are all white. Some old Whales are said to have a broad white stripe over their back down to the belly (Laing's ‘Voyage to Spitzbergen,’ p. 126: 1815). I cannot confirm this from my own observation.

each side of the gum, is a continuous curve, broadest anteriorly, pale blue, sides pale blue and carnation mixed. The upper lip is very much smaller than the under. The lips are furrowed immediately behind the edge and bevelled, and are all deep black and speckled. No traces exist of either eyebrows or eyelashes. The eye is very small and hollow, measuring from canthus to canthus  $3\frac{1}{2}$  inches (in adult), and  $1\frac{1}{2}$  inch deep, with a deep furrow superiorly and inferiorly immediately above and below the eye. The inside of the eyelid is red. The aperture of the auricular canal is difficult to find, and is not larger than the diameter of a goose-quill. The laminae or "splits" of whalebone are longest in the middle, but grow much shorter posteriorly to this "size-split." The number of laminae is about 360 on each side. The whalers have a notion that there is a lamina for each day in the year; but this, like the idea that Jonah's face can be seen on the nose of the Whale, is, I am afraid, a rather hasty generalization. Each lamina ends in a tuft of hair, this tuft being continuous with the hair on the inside of the bone, this "hair" again being composed of identically the same substance as the whalebone itself. The outside of the bone is smooth, pale blue-coloured, with the edges overlapping, the free edges pointing posteriorly, but with an interval (varying according to the age of the animal) between the laminae of so very regular a character that each lamina can be seen and even counted from the outside. Where the bone is placed in the gum it is of a greyish-white colour, and on exposure to air becomes black; all of the portions of the bone most exposed are of a blackish colour. On the outside of the laminae, a few inches from the end, is a transverse wave or ridge, continuous in a slightly elevated ridge across the whole of the laminae; and in old Whales there are several of these wavy transverse ridges, which are apparently in some way connected with its growth. The best whalebone has several of these ridges. Interiorly, in front of the place where each lamina is inserted into the gum, are several rows of short stumps of whalebone terminated by a tuft, and before these again short white hair laminae graduating into a velvet-like substance in the mouth. It is said that the laminae, after once being produced, do not increase in number, but that the interspaces of the laminae increase in width. This interspace in adult Whales is from about half an inch to one inch in width. Occasionally two splits are found growing together in the gum, but separate below. The length of the whalebone depends, it is said, on the size of the head, and bears no ratio to the length of the body. Occasionally a long Whale has small and short whalebone, whilst a short dumpy individual (for there are individual differences in these as in all other animals, not referable to specific difference) may have much longer. The longest lamina of whalebone which I have heard of being obtained was 14 feet. I have personally known of another 13 feet 3 inches long; but the average length is 12 feet and under. This is the middle split already spoken of, known to the whalers as the "size-split;" but in the measurement of this the tuft of "hair," which sometimes reaches six or seven inches in length, is not included—a very important matter, as much depends upon the



size of this split. The breadth and thickness of the laminæ depend upon the age of the animal. It is a common belief that the laminæ of whalebone in the female Whale are broader but shorter than in the male. The colour of the whalebone likewise varies: in the young the laminæ are frequently striped green and black, but in the old animal they are frequently altogether black; often some of the laminæ are striped in alternate streaks of black and white, whilst others want this variegation. Whalebone is said to be occasionally found white, without the animal differing in the slightest degree. That brought from the western Eskimo in the spring is often whitish, because they have kept it lying about or steeped in water all the winter. It also does not necessarily follow that because one whalebone brings a different price from another, the animals that produce them are of different species. For instance, the whalebone brought by the American whalers from Kemisoak (Cumberland Sound, or Hogarth's Sound of Penny) used to bring a less price in the market than that of the English whalers from Davis Strait, Raffen's Bay, and Spitzbergen, because it had lain exposed during the winter and was accordingly worse prepared; therefore, without at all underrating the importance of pressing every point into our service in discriminating the different species of *Balænidæ*, as the whalebone is subject to so much variation, and undergoes so many artificial changes before coming into the hands of the zoologist, I think that we must proceed with the utmost caution in forming species on the mere differences presented by isolated laminæ of whalebone\*.

The *pectoral fins* (or, more properly, swimming-paws†) are of a darkish grey at the axilla, rounded superiorly and bevelled off inferiorly. The upper edge is arcuate in form, with a slight angularity medially; the inferior edge with the outline in a gentle sigmoid curve, with the greater convexity of the curve anteriorly. The *caudal extremity*, if not the homologue, is undoubtedly the analogue of the posterior extremities in other mammals. It is almost unnecessary to say that the substance of the tail is non-muscular, though it has been described as such in various publications, the only power which it possesses being derived from the attachment of some of the lumbar and other muscles in the extremity of the vertebral column. A transverse section of the root of the tail shows:—1, the epidermis; 2, the soft skin; 3, the blubber, or a cellular substance containing fat-cells; 4, cartilage enveloping the tendinous cells; 5, strong muscular fasciæ, through which the tendons play; 6, spinal canal and vessels; 7, spinal cartilages; 8, blood-vessels; and, 9, synovial glands. A transverse section of the tail shows skin, blubber, tendinous envelope, blood-vessels, and a central cartilaginous

\* Of late years whalebone has been bringing a better price than formerly, new uses for it having been discovered. A large amount is now used to stiffen silks by being woven into the fabric. By an old feudal law the *tail* of all Whales belonged to the Queen, as a perquisite to furnish Her Majesty's wardrobe with whalebone (Blackstone's Commentaries, vol. i. p. 233, ed. 1783).

† Fleming, 'Philosophy of Zoology.'



mass\*. Though, *per se*, the tail has no power, yet as the instrument through which the lumbar muscles (the tendinous attachments of which seem to be prolonged into the cartilaginous substance of the tail) work it exerts enormous force. The figure usually engraved in boys' books of sea adventures, and copied from Scoresby's 'Account of the Arctic Regions,' of a Whale tossing a boat and its crew up into the air, is generally looked upon by all the whalers to whom I have shown it as an artistic exaggeration. Accidents of this nature are very rare, and never proceed to such an extent; and I have no doubt that Dr. Scoresby's artist has taken liberties with his description, that worthy navigator being himself above any suspicion of exaggeration for the sake of effect. Capt. Alexander Deuchars, who has now made upwards of fifty voyages into the Arctic regions, informed me that he had known a Whale toss a boat nearly 3 feet into the air, and itself rise so high out of the water that you could see beneath it, but that, if Scoresby's figure was correct, the Whale must have tossed the boat very many feet into the air—a feat which he did not think was within the bounds of, if not possibility, yet of probability.

The *teats* are hardly the size of a cow's, are placed about the middle, and one inch from the edge of the sulcus, but in the dead animal are almost universally retracted within the white-coloured or spotted sulcus, in the middle of which they are situated. The *milk* is thick, rich, and rather sweet-tasted. The fæcal evacuations of the Whale are red-coloured, most probably due to the red *Cetochili* and other animals which form the bulk of its food. The *skin* (including the cuticle) is about  $1\frac{1}{2}$  inch in thickness all over the body, but is rather thicker on the tail, on which organ, however, it is of a uniform thickness. The *blubber* varies from about a foot to eighteen inches in thickness, tolerably uniformly throughout, except on the head, &c.; the colour is like lard or pork fat in young animals, but in the older ones rosy-coloured, from the quantity of nutrient blood-vessels in it. The *flesh* is dark and coarse-fibred, but when properly cooked tastes not unlike tough beef. When the French had whalers in Davis Strait, the sailors, with the usual aptitude of their nation for *cuisine*, made dainty dishes of it; but our seamen, imbued with the virulent dietetic conservatism of the Saxon, prefer to grow scurvy-riddled rather than partake of this coarse though perfectly wholesome food.

The best figure of the Right Whale is that of Scoresby; but in Harris's 'Collection of Voyages' there is a very good figure of the animal (almost as good as Scoresby's), accompanied by a very tolerable description. I think Scoresby's figure is erroneous, in so far as I have never been able to see the prominence behind the head which he figures; and the notch shown in the outline figure of the genus in the first edition of the 'British Museum Catalogue of Whales' does not exist in nature; but as Dr. Gray does not mention

\* A tolerably good account of these and other points in the economy of the Cetacea, mixed up with a heterogeneous mass of errors, is to be found in the (deservedly?) neglected 'Natural History of the Cetacea,' &c., by H. W. Dewhurst (1834).

it in his description, I presume that it is placed there through an error of the draughtsman or lithographer.

The size of the Greenland Whale has, I think, been a little underrated. The late Dr. Scoresby, from abundant data, considered that we have no record of the Whale to be relied upon which gives a greater length than 60 feet. While agreeing with him so far, that I believe that to be the general extreme average, I am very doubtful whether they did not at one time, before they were so ruthlessly slaughtered, attain a greater size, or that individuals are not even now found of a greater size. The position in which a Whale is measured alongside the ship when slightly doubled is apt to introduce an error into the measurement and make it smaller than it really is. The late Chevalier Charles Louis Giesecke mentions one which was killed at Godhavn in Greenland in 1813 which measured 65 feet, and I shall presently give the measurements of one equally large. The largest one, however, which is known to have been killed in the Arctic seas was one which Capt. Alexander Deuchars (whom I have already had occasion to mention as a most trustworthy and experienced whaler, and who is personally acquainted with the killing of upwards of 500 Whales) obtained in Davis Strait in the year 1849. It measured 80 feet in length, the breadth of the tail, from tip to tip, being 29 feet; the longest lamina of whalebone measured 14 feet; the amount of whalebone in its mouth was large; but the blubber was only about 6 inches in thickness, and only yielded 27 tuns of oil\*. The Whales killed in the Spitzbergen sea are said, as a rule, to be generally less and "lighter-boned" (*i. e.* less whalebone) than those of Davis Strait, which may possibly account for the less size of those seen by Scoresby, whose whaling-experience was almost wholly confined to the former region. The females are larger and fatter than the males. I append the measurements of one of the largest Whales recently killed in Davis Strait, for which we are indebted to Dr. Robert Goodsir.

*Measurements of a specimen of Balæna mysticetus killed in Pond's Bay, Davis Strait (♀).*

	ft.	in.
Length from the fork of the tail, along the abdomen, to tip of lower jaw . . . . .	65	0
Girth behind swimming-paws . . . . .	30	0
Breadth of tail, from tip to tip . . . . .	24	0
Greatest breadth between lower jaws . . . . .	10	0
Length of head, measured in a line from articulation of lower jaw . . . . .	21	0
Length of vulva . . . . .	1	2
From posterior end of vulva to anus . . . . .	0	6
From anterior end of vulva to umbilicus . . . . .	8	0
Mammæ placed opposite the anterior third of vulva, and 6 inches from tip of it.		

\* The tun of oil is 252 gallons wine measure; at a temperature of 60° Fahr. it weighs 1933 lbs. 12 oz. 14 dr. avoirdupois.

	ft.	in.
Length of sulcus of mammæ . . . . .	0	3
Breadth of sulcus, on each side of it . . . . .	0	2
From tuberosity of humerus to point of pectoral fin . . . . .	8	0
Greatest breadth of fin . . . . .	3	11
Depth of lip (interior of lower) . . . . .	4	7
From the inner canthus of eye to extreme angle of fold of mouth . . . . .	1	5
From inner to outer canthus . . . . .	0	6
Length of block of laminæ of baleen, measuring round the curve of the gum, after being removed from the head ..	16	6
Length of longest lamina on each side . . . . .	10	6
Distance between the lamina at the gum . . . . .	0	$\frac{7}{8}$
Breadth of pulp-cavity of largest lamina . . . . .	1	0
Average length of pulp when extracted from some of the largest laminæ . . . . .	0	5
Number of laminæ on either side, about 360.		

The length along the curve of the back and other measurements desirable to have been taken were not able to be made out, from the position of the Whale, as it was suspended in the water alongside.

( $\gamma$ ) *Habits &c.*—The Right Whale is a gregarious animal, being generally found in small “schools” of three and four, but when travelling from one part of the ocean to another they will sometimes collect in large parties. I am told by my friend Dr. James M'Bain, R.N., that about thirty years ago he witnessed an extraordinary migration of this nature a little to the south of Pond's Bay. The Whales to the number of several hundreds passed north in a continuous flock, and a few days afterwards were succeeded by an even still more numerous herd of Walruses. The numbers of the latter were beyond all computation; hour after hour did they travel to the northward, never pausing to feed, but all seemingly intent on reaching the opening of Lancaster Sound. A few days subsequently not one was to be seen, as previously there had been no signs of their presence. This was undoubtedly a very rare scene; and the question which must suggest itself is, where could such a number of these huge animals have come from? The Whale is capable of travelling at a very fast rate when irritated by wounds or impelled by fear of its enemies. I was told by the late Capt. Graville, of the screw whaler ‘Diana,’ a proverbially experienced and truthful man, that a Whale was struck near the entrance of Scoresby's Sound, on the east coast of Greenland, by the father of the late Dr. Scoresby (with whom Mr. Graville was a fellow apprentice); but being lost, it was killed next day near the entrance of Omenak fjord, on the west coast, with the harpoons freshly imbedded in its body. This was adduced in proof of the existence of an inlet in former times (as, indeed, represented on the old maps) across Greenland between these two points. Unless the whole story was founded on a misconception (an event less likely from the searching investigation which took place at the time), we can scarcely believe that the Whale

could have reached the west coast by any other means; for, even allowing the greatest credible speed, it comes scarcely within the limits of possibility that it could have doubled Cape Farewell and reached 70° N. latitude within the interval mentioned. The rate at which a Whale travels from place to place whilst feeding, or under other ordinary circumstances, may be stated as being about four miles an hour. Like most of the Cetacea, it generally travels in a course contrary to that of the wind. Its *food* consists, for the most part, of Entomostraca and Pteropoda, but chiefly of the former, and especially of *Cetochilus arcticus*, Baird, and *Cetochilus septrionalis*, H. Goodsir, *Arpacticus kronii*, Kröy., &c., which are chiefly found in those portions of the sea of the olive-green colour described by Scoresby. This appearance has been shown\* to be produced by vast quantities of *Diatomaceæ*, chiefly *Melosia arctica*, on which the "Whales' food" subsists. It is not, I am of opinion, compatible with facts to suppose that the 'Right Whale's food is composed in any part of fishes proper, except, perhaps, a minute individual which may now and then accidentally find its way into its stomach with the mass of *maidre* (as the Whale's food is called). Many of the old whalers contend otherwise, and will adduce measurements of the diameter of the gullet in proof that much larger animals than *Acalephæ*, Pteropoda, or Entomostraca could be received in the stomach. I have never measured the orifice of any œsophagus which exceeded 2½ inches in diameter, though as these observations were generally made on young Whales, it is not improbable that this size may be exceeded in some individuals. Most of the slimy-looking substances found floating in the Arctic seas are generally masses of *Diatomaceæ* combined with Protozoa, &c.; but in some cases it is the mucous lining of the bronchial passages which has been discharged when the animal was "blowing." This "blowing," so familiar a feature of the Cetacea, but especially of the Mysticete, is quite analogous to the breathing of the higher mammals, and the "blow-holes" are the perfect homologues of the nostrils. It is most erroneously stated that the Whale ejects water from the "blow-holes." I have been many times only a few feet from the Whale when "blowing," and, though purposely observing it, could never see that it ejected from its nostrils anything but the ordinary breath—a fact which might almost have been deduced from analogy. In the cold Arctic air this breath is generally condensed, and falls upon those close at hand in the form of a dense spray, which may have led seamen to suppose that this vapour was originally ejected in the form of water. Occasionally when the Whale blows just as it is rising out of or sinking in the sea, a little of the superincumbent water may be ejected upward by the column of breath. When the Whale is wounded in the lungs, or in any of the blood-vessels immediately supplying them, blood, as might be expected, is ejected in the death-throes

\* On the Nature of the Discoloration of the Arctic Seas (Seemann's Journal of Botany, February 1868; Transactions of the Botanical Society of Edinburgh, vol. ix.; Quart. Journ. Mic. Science, October 1868; Das Ausland, February 27th, 1868).



along with the breath. When the whaleman sees his prey "spouting red," he concludes that its end is not far distant; it is then mortally wounded. The Whale carries its young nine or ten months, and produces in March or April. In the latter month a Hull ship obtained a *sucker* with the umbilical cord still attached. It rarely produces more than one at a birth, though it is said that in a few instances two have been seen following the female. It couples during the months of June, July, or August, and, as in most, if not all, of the Cetacea, this operation is performed in an upright and not in a recumbent position, as stated in some works, the authors of which might be supposed to speak from personal observation\*. Equally erroneous, as far as I can learn, is the idea that it only produces once in two years; but on this subject, as on many others concerning the Cetacea, it would be difficult to pronounce an opinion founded on any decided knowledge. In the month of August I have seen them in the position described, with the pectoral fins adpressed against each other's body, and the male lashing the water with his tail. The young suckles to a considerable age (probably one year), and in order to allow of its getting convenient access to the mammaræ the mother lies on its side for a time. Their love of their offspring is so strong, that though the cubs are of very little value, yet the whalers often make a point of killing them in order to render the mother more accessible. During the period of procreation the mother is much fiercer and more dangerous to approach than at other seasons, when it is a timid, harmless animal. I once saw a Whale, when the boats were approaching it, take the young under one pectoral and swim off by aid of the other. When the mother was killed, the cub could not be made to leave the dead body of its mother, though lances were continually run into it by the seamen who were flensing the animal. When the carcass was let go, the young one instantly dived down after it, nor did we see it again. The *sight*, *hearing*, and *smell* of the Whale are all very acute in the water, but are very dull out of it. The power of the Cetacea for remaining beneath the surface of the sea seems to bear a direct ratio to their size. Under ordinary circumstances, the Right Whale will generally remain no longer than half an hour without rising again to breathe; the cubs are, however, more stubborn, and will often remain more than three-quarters of an hour. Whalers and Eskimo have many stories of Whales lying torpid at the bottom of shallow inlets and bays for several days at a time; though I have heard these tales repeated by most credible men, yet I am inclined to hesitate at receiving as facts anything so contrary to physiological laws, and so incapable of receiving any explanation of a reasonable nature†. I have frequently known Whales dive and not come up for hours; but, unfortunately for the acceptance of these wonderful tales of subaquatic being, these universally came up dead! In nearly every case it appears that, diving with tremendous impetus under the tortures of the harpoon, they had struck their heads on the bottom

\* Dewhurst, 'Natural History of the Cetacea,' p. 20.

† *Vide* also Dewhurst, *l. c.* p. 36.



with such force as to stun them for the time being, and before they recovered were drowned; the Whale's nose was in nearly every instance covered with the mud of the bottom. This diving to the bottom is a favourite feat of young Whales; and accordingly these frisky individuals are more difficult to capture than the adult ones of a more staid temperament. All species of Cetacea seem to pass a considerable portion of their time asleep on the surface of the water, and in this position they are often struck. The Right Whale always keeps near the land-floes of ice; and its migrations north and west seem to be due to this habit\*.

After man, the chief enemy of the Whale is *Orca gladiator*, the most savage of all the Cetacea, and the only one which feeds upon other animals belonging to the order. The Thresher Shark (*Carcharias vulpes*), the very existence of which Scoresby seemed to doubt, but which is now so comparatively well-known to naturalists and seamen, is also an enemy of the Whale. It is doubtful, however, whether it attacks it in life, or only preys upon it after death. The 'Advice' (Capt. A. Deuchars) once took a dead Whale alongside which this Shark was attacking in dozens, the belly being perfectly riddled by them†.

The Greenland Shark (*Scymnus borealis*, Flem.), though it gorges itself with the dead Whale, does not appear to trouble it during life. Martens's most circumstantial account of the fight between the Whale and Swordfish seems to have originated in a misconception, this name being applied by seamen not only to the Scombroid fish (*Xiphias*), but also to the *Orca*, which, it is well-known, fights furiously with the Right Whale. The Whale must attain a great age, nor does it seem to be troubled with many diseases. Whales which are found floating dead are almost always found to have been wounded. They are often killed with harpoon-blades imbedded deep in the blubber; and some of them, from the marks on them, have been proved to be the remains of fights of a very ancient date in which the Whale has come off victor.

(δ) *Geographical distribution and migrations*.—The geographical distribution and migration of the Whale on the coast of Danish Greenland has been fully discussed by Eschricht and Reinhardt‡, and in the Spitzbergen sea by Scoresby§; so that I confine what few remarks I have to make on this subject to its range along the northern shores of Greenland and the western shores of Davis Strait and Baffin's Bay, where the whalers chase it. They appear on the coast of Danish Greenland early in May, but are not nearly so plentiful as formerly, when the Davis-Strait whaler generally pur-

\* Capt. Wells in the Dundee whaling steamer 'Arctic' ran, in the summer of 1867, high up into Smith's Sound in search of Whales. He found *open water* and *no Whales*—a case of cause and effect (Sherard Osborn, Proc. Roy. Geogr. Soc. vol. xii. p. 103, Feb. 10th, 1868).

† The sailors have a notion that the Shark does not bite out the pieces, but cuts them by means of its curved dorsal fin, and seizes them as they drop into the water! This belief is widely and firmly received.

‡ Ray Soc. Mem. Cet.

§ 'Arctic Regions,' 'Voyage to Greenland,' and 'Memoirs of the Wernerian Society of Edinburgh' (1811), vol. i. p. 578.

sued his business on this portion of the coast; but they are now so few that they have generally gone north before the arrival of those ships which have first proceeded to the Spitzbergen sealing. It is rarely found on the Greenland coast south of  $65^{\circ}$ , or north of  $73^{\circ}$ ; indeed I have only heard of one instance in which it has been seen as far north as the Duck Islands near the entrance of Melville Bay, and even for a considerable distance south of that it can only be looked upon as an occasional straggler. However, after crossing to the western shores of Davis Strait, it occasionally wanders as far north as the upper reaches of Baffin's Bay. The great body, however, leave the coast of Greenland in June, crossing by the "middle ice," in the latitude of Svarte Huk (Black Hook), in about lat.  $71^{\circ} 30'$  N. The whaler presses with all speed north through Melville Bay to the upper waters of Baffin's Bay, and across to the vicinity of Lancaster Sound. If there is land-ice in Baffin's Bay at the time they arrive (about the end of July), there are generally some Whales up that Sound and Barrow's Inlet; but they accumulate in greatest numbers in the neighbourhood of Pond's Bay, and even up Eclipse Sound, the continuation of the so-called Pond's Bay, which is in reality an extensive unexplored sound opening away into the intricacies of the Arctic archipelago. The Whales continue "running" here until the end of June, and remain until about the end of August or beginning of September. The whalers think that if they can reach Pond's Bay by the beginning of August they are sure of a "full" ship. The Whales now commence going south, and the whalers continue to pursue them on their austral migration, halting for that purpose in Home Bay, Scott's Inlet, Clyde River, &c. As the season gets more tempestuous and the nights dark, most of them towards the end of September, to avoid the icebergs dashing about in this region at that time of the year, anchor in a snug cove, or *cul de sac*, lying off an extensive unexplored sound, not laid down on any map, in the vicinity of Cape Hooper; others go into a place known by the euphonious name of "Hangman's Cove"\*; whilst others go south to *Kemisoak* (Hogarth's Sound of Penny), Northumberland Inlet, or other places in the vicinity of Cumberland Sound and the Meta Incognita of Frobisher,—localities intimately known to many of these hardy seamen, but by name only to geographers. Whilst the good ship lies secure in these unsurveyed and unauthorized harbours (each master mariner according to his predilection), the boats go outside to watch for Whales. If they succeed in capturing one, frequently, if possible, the vessel goes out and assists in securing it. Though they are supposed to return to the ship every night, yet at this time the men are often subjected to great hardship and danger. This is known as the "autumn" or "fall fishing," and this method of pursuing it as "rock-nosing."

M. Guérin, the surgeon of a whaler, has described† what he considers a marked variety of the Right Whale under the name of the "Rock-nosed Whale." The characters which he gives (such as the head being considerably more than one-third the size of the animal,

\* From an Eskimo being found here hung by an *allunak* over a cliff.

† Edinb. New Phil. Journ. 1845, p. 267.

or as 16 to 51) vary in almost every individual. The size of the head, for instance, differs a little in almost all individuals; and Scoresby merely gave one-third the size of the body as the average, not as the unvarying proportion. Whales of different ages keep a good deal together: hence young Whales frequent the bays; the old ones roam in the vicinity of the "middle ice" of Davis Strait, and afterwards come into the bays; and those killed early in the year at Pond's Bay are chiefly young animals. Hence the whaler uses the terms "middle-icers," "rock-nosers," and "Pond's-Bay fish" to designate not a separate species or even variety, but to express a geographical fact and a zoological habit. According to the state of their cargo, the industry of the captain, or the state of the weather, the Whalers leave for home from the 1st to the 20th of October, but rarely delay their departure beyond the latter date.

Where the Whale goes to in the winter is still unknown. It is said that it leaves Davis Strait about the month of November, and produces young in the St. Lawrence River, between Quebec and Camarora, returning again in the spring to Davis Strait. At all events, early in the year they are found on the coast of Labrador, where the English whalers occasionally attack them; but the ships arrive generally too late, and the weather at that season is too tempestuous to render the "South-west Fishing" very attractive. Later in the year the ships enter Cumberland Sound in great numbers; and many of them (especially American and Peterhead vessels) now make a regular practice of wintering there in order to attack the Whales in early spring. It is said that early in September they enter Cumberland (Hogarth's) Sound in great numbers and remain until it is completely frozen up, which, according to Eskimo account, is not until the month of January. It is also affirmed by the natives that when they undertake long journeys over the ice in spring, when hunting for young Seals, they see Whales in great numbers at the edge of the ice-floe. They enter the Sound again in the spring and remain until the heat of summer has entirely melted off the land-floes in these comparatively southern latitudes. It thus appears that they winter (and produce their young) all along the broken water off the coast of the southern portions of Davis Strait, Hudson's Strait, and Labrador. The ice remaining longer on the western than on the eastern shore of Davis Strait, and thus impeding their northern progress, they cross to the Greenland coast; but as at that season there is little land-ice south of  $65^{\circ}$ , they are rarely found south of that latitude. They then remain here until the land-floes have broken up, when they cross to the western shores of the Strait, where we find them in July. I am strongly of belief that the Whales of the Spitzbergen sea never, as a body, visit Davis Strait, but winter somewhere in the open water at the southern edge of the northern ice-fields. The Whales are being gradually driven further north, and are now rarely found, even by their traces\*, so far south

\* The recent visit of Whales to a particular locality can frequently be known by a peculiar oiliness floating on the water, and (the whalers say, though I confess I was never sensible of it) an unmistakeable odour characteristic of this Cetacean.



as the Island of Jan Mayen ( $71^{\circ}$  N. lat.), round which they were so numerous in the palmy days of the Dutch whaling trade. I am not quite sure, after all that has been said on this subject, that the Whale is getting extinct, and am beginning to entertain convictions that its supposed scarcity in recent times is a great deal owing to its escaping to remote, less known, and less visited localities. It is said to be coming back again to the coast of Greenland, now that the hot pursuit of it has slackened in that portion of Davis Strait. The varying success of the trade is owing not so much to the want of Whales as to the ill luck of the vessels in coming across their haunts. Every now and again cargoes equal to anything that was obtained in the best days of the trade are obtained. Only seven years ago I came home to England "shipmates" (as the phrase goes) with no less than thirty Right Whales, in addition to a miscellaneous menagerie of Arctic animals dead and alive, and a motley human crew—a company so *outré* that I question if ever naturalist, or even whaler, sailed with the like before.

(ε) *Economic value*.—After the very excellent account of Scoresby, it would be mere pleonasm on my part to say one word regarding the commercial importance of the Whale. The introduction of steam, the almost universal use of the gun-harpoon, and the discoveries of Ross and Parry on the western shores of Davis Strait have greatly altered the nature of the "Strait fishery" since Scoresby's time. For this reason I have given the outline of a whaler's summer cruise, more especially as it illustrates, according to my observation, the range and migrations of the Right Whale.

(ζ) *Varieties of Balæna mysticetus*.—The whalers do not recognize any varieties of the Right Whale by specific names, nor do I of my own knowledge know of any entitled to that rank. Professors Eschricht and Reinhardt\* consider that there is a second species of Right Whale found in the Greenland and northern seas, the "Nordcaper" (*Balæna nordcaper*, Bonnat.; *Balæna islandica*, Briss., &c.), the "Sletbag" of the Icelanders, and that the following facts have been ascertained regarding it:—1st, that it is much more active than the Greenland Whale, much quicker and more violent in its movements, and accordingly both more difficult and dangerous to capture; 2nd, that it is smaller (it being, however, impossible to give an exact statement of its length) and has much less blubber; 3rd, that its head is shorter, and that its whalebone is comparatively small and scarcely more than half the length of that of the *B. mysticetus*; 4th, that it is regularly infested with a cirriped belonging to the genus *Coronula*, and that it belongs to the temperate North Atlantic as exclusively as the *B. mysticetus* belongs to the icy sea, so that it must be considered exceptional when either of them strays into the range of the other. Moreover they considered that in its native seas it was to be found further towards the south in the winter (viz. in the Bay of Biscay, and near the coast of North America down to Cape Cod), while in the summer it roved about in the sea around Iceland and between this island and the most northerly

\* *Loc. cit.*

part of Norway. Dr. Eschricht considered that this was the Whale captured by the Basque whaler in the seventeenth century; hence he has called it *Balæna biscayensis*. A considerable portion of this description corresponds with what I have said regarding the Spitzbergen Whales as a race.

I have heard that "barnacles" had been got on Whales; but these were looked upon as a sign of age in the Whale. It is now a question to what species the Right Whales now and then stranded on the European coasts are to be referred. What the "Scrag Whale" of Dudley\* (*Balæna gibbosa*, Erxl.) is I cannot imagine. It is not now known to the whalers; and as neither of the species referred to have as yet been found in Davis Strait or Baffin's Bay†, they do not come within the limits which I have assigned to myself.

## 2. *PHYSALUS ANTIQUORUM*, Gray.

*Balænoptera musculus*, Flem. Brit. An. p. 30.

*Rorqualus musculus*, F. Cuv. Cétacés, p. 334.

*Balæna physalus*, Fab. Fauna Grœnl. p. 35.

Popular names.—*Big Finner*, *Razorback* (English whalers); *Sillhval* (Swedish); *Sildrör*, *Rören* (Norse); *Sildreki* (Icelandic); *Tunnolik* (Greenlanders).

This species, in common with most of the family *Balænopteridæ*, does not go far north as a rule, but keeps about the Cod-banks of Rifkol, Holsteensborg, and other localities in South Greenland‡. They feed upon Cod and other fish, which they devour in immense quantities. Desmoulins§ mentions 600 being taken out of the stomach of one; I know an instance in which 800 were found. They often, in common with *Balænoptera gigas* and *B. rostrata*, wander into the European seas in pursuit of Cod and Herrings, and are quite abundant in the vicinity of Rockal. A few years ago much excitement was got up about the number of "Whales" found in that locality, and companies were started to kill them, supposing them to be the Right Whale of commerce. As might have been expected, they proved only to be "Finners," which prey on the immense quantities of Cod which are found there. This Whale is accounted almost worthless by the whalers; and, on account of the small quantity of oil which it yields and the difficulty of capture, it is never attacked unless by mistake or through ignorance. I remember seeing one floating dead in Davis Strait, to which the men rowed, taking it for a Right Whale; but on discovering their mistake they immediately abandoned it. They had apparently not been the first; for on its sides were cut the names of several vessels which had paid it a visit

\* Phil. Trans. vol. xxxiii. p. 259.

† Crantz's description of the *Knotenfish*, or *Knobbelfisch* (Greenland, vol. i. p. 146), is not derived from his own knowledge, but, like most of his descriptions, is copied from previous authors.

‡ I am aware that this statement is somewhat at variance with Dr. Eschricht's, as contained in his paper on the "Geographical Distribution of some of the Northern Whales" (Forh. Skand. Naturf. Kjöb. 1847, p. 103); nevertheless I think that it will be found to be substantially correct.

§ Hamilton on Whales (Jardine's Nat. Lib.).



and did not consider it worth the carriage and fire to try out the oil. The blubber is hard and cartilaginous, not unlike soft glue. Its "blowing" can be distinguished at a distance, by being whiter and lower than that of *Balæna mysticetus*.

### 3. BALÆNOPTERA GIGAS, Eschr.

*Sibbaldius borealis*, Gray, Cat. Seals and Whales, p. 175.

Popular names.—This is popularly confounded with the last, and the same names are applied to it by the whalers and Eskimo. It is probably also the *Kepokarnak* of the Greenlanders.

It visits the coast of Greenland only in the summer months, from March to November; and its range may be given as the same as the last. In common with the former, it is rarely killed by the natives.

### 4. BALÆNOPTERA ROSTRATA, O. Fab.

Popular names.—*Little Finner*, *Pike Whale* (English whalers and authors); *Waagehval* (Norse); *Tikagulik* (Greenlanders); *Tschikagleuch* (Kamschatkdales).

This Whale only comes in the summer months to Davis Strait and Baffin's Bay, or very seldom during the winter to the southern portion of Greenland. It is not killed by the natives; and its range is that of its congeners. The natives of the western shores of Davis Strait seldom recognized the figure of this and allied species of Whales, though the Greenlanders instantly did so\*.

### 5. MEGAPTERA LONGIMANA, Gray.

*Balænoptera boops*, O. Fab. Faun. Grœnl. p. 36 (non Linn.?).

Popular names.—*Humpback* (English whalers); *Rörqval*, *Stor Rörhval* (Norse); *Keporkak* (Greenlanders and Danes in Greenland).

This Whale is only found on the Greenland coast in the summer months. For many years it has been regularly caught at the settlement of Frederikshaab, in South Greenland. In North Greenland it is not much troubled. Whilst dredging in the harbour of Egedesminde one snowy June day a large *Keporkak* swam into the bay; but though there were plenty of boats at the settlement, and the natives were very short of food, yet they stood on the shore staring at it without attempting to kill it. The natives of this settlement are, no doubt, the poorest hunters and fishers in all North Greenland (if we except Godhavn, the next most civilized place); but there were at that time at the settlement natives from outlying places. Capt. John Walker, in the 'Jane' of Bo'ness, one year, in default of better game, killed fifteen Humpbacks in Disco Bay. He got blubber from them sufficient, according to ordinary calculation, to yield seventy tuns of oil; but on coming home it only yielded eighteen. The bone

\* In a Greenland skeleton at Copenhagen, according to Eschricht, the lateral processes of the fifth and sixth cervical vertebræ are united, which is not the case with one from Norway. We cannot be too cautious in separating species on such distinctions.

is short and of little value. Though one of the most common Whales on the Greenland coast, yet, on this account and being difficult to capture, it is rarely troubled.

#### 6. CATODON MACROCEPHALUS, Lacép.

*Physeter macrocephalus*, Linn. Syst. N. i. p. 107; O. Fab. Fauna Grœnl. p. 41.

Popular names.—*Sperm-Whale* (English); *Kegutilik* (Greenlanders). It is probably also the *Potvisch* (Norse), and *Tweld-Hval* (Icelandic).

Though currently reported in all compilations as one of the most common animals of the Arctic seas, and especially of Davis Strait and Baffin's Bay, it can only be ranked as a very rare, and possibly accidental, straggler. Whatever it was formerly, it is now only known to Davis-Strait whalers by name; many will even ridicule the notion of its being an inhabitant of those seas. I found very few Eskimo who knew it even by tradition; and I could only hear of one recent instance of its being killed on the coast of Greenland, viz. near Proven (72° N. lat.) in 1857.

#### 7. DELPHINUS EUPHROSYNE, Gray.

*Delphinus holbœllii*, Eschricht, Skand. Naturf. Møde i Kjöbenhavn, 1847, p. 611.

This species is only known as a member of the Greenland fauna by a skeleton from South Greenland. It is apparently unknown to the natives, for they have no popular names for it.

#### 8. LAGENORHYNCHUS ALBIROSTRIS, Gray.

*Delphinus ibsenii*, Eschricht, Unders. over Hvald. 5<sup>te</sup> Afh. i Vid. Selsk. Nat. Math. Afh. xii. 297.

This is only known as a Cetacean of Davis Strait by a skeleton from Greenland in the Copenhagen Museum. It is found also in the Faroe Islands, and in various portions of the North Sea.

#### 9. LAGENORHYNCHUS LEUCOPLEURUS (Rasch), Gray.

Dr. Gray\* has referred a skeleton from Greenland in Mr. Brandt's collection to this species, and on his authority solely I claim it as a member of the Greenland fauna. We possess no particulars of its history as an Arctic animal. The Norwegians know it as the *Qwitskjæving*.

#### 10. ORCA GLADIATOR (Bonn.), Sund.

*Delphinus orca* (L.); O. Fab. Fauna Grœnl. p. 46.

*Physeter microps*, Fab. F. G. no. 27; Reinhardt, Naturh. Tillæg til en Geog. og Stat. Breskrev. af Grönl. p. 12.

Popular names.—*Grampus*, *Killer*, *Swordfish* (English seamen);

\* Zool. Erebus and Terror, p. 34, t. 3; Cat. Seals and Whales (1866), p. 273.

*Späckhuggare*, *Svärdfisk* (Swedes); *Stourvagn*, *Staurhyning* (Norse); *Ardluik* or *Ardluk* ♀, *Ardlurksoak* ♂ (Greenlanders). In all probability the "*Pernak*," or *Parnak* (*Physeter catodon*, O. Fab.), is also to be referred to *Orca gladiator*. Hr. Fleischer assured me that it was an *Orca*, but only known to him by name. Curiously enough, the Kamschatdales and Aleutians have very similar names (*Agluck*, fide Pallas, Zool. Rosso-Asiat. p. 305; and *Aguluck*, fide Chamisso, Nov. Act. Acad. Nat. Cur. vol. xii. p. 262) for animals closely allied to, if not identical with, this species.

The *Ardluk* is only seen in the summer time along the whole coast of Greenland. Wherever the White Whale, the Right Whale, or the Seals are found, there is also their ruthless enemy the Killer. The White Whale and Seals often run ashore in terror of this Cetacean; and I have seen Seals spring out of the water when pursued by it. The whalers hate to see it, for its arrival is the signal for every Whale to leave that portion of the sea. It is said that it will not go among ice, and that the Right Whale, when attacked by it, keeps among ice to escape its persecution. Occasionally the ends of the laminæ of whalebone are found bitten off, apparently by the Killer; and probably this is the origin of the story that it preys on the tongue of the Whale. Linné\* very happily styles it—"Balænarum phocarumque tyrannus† quas turmatim aggreditur." Though subsisting chiefly on large fishes, they will not hesitate to attack the largest Whalebone Whales, and are able to swallow whole large Porpoises and Seals. Dr. Eschricht took out of the stomach of one thirteen Porpoises and fourteen Seals, the voracious animal having been choked by the skin of a fifteenth. It has been known to swallow four Seals at least immediately one after the other, and in the course of a few days as many as twenty-seven individuals‡. I know of a case in which they attacked a white-painted herring-boat in the western islands, probably mistaking it for a *Beluga*!

#### 11. PHOCÆNA COMMUNIS, Brookes.

Popular names.—*Purpess*, *Sea-pig* (English seamen); *Marsuin*§, *Herring-hogs*, *Pellock*, *Bucker*, *Puffy-dunter*, *Neesock*§ (fishermen of Northern Islands and coasts of Scotland); *Nisa* and, more rarely, *Piglertok* (Greenlanders).

The Porpoise arrives in the spring in Davis Strait, and stops there until November, but does not go further north than from lat. 67° to lat. 69° N. They are now and then caught off the coast during

\* Mant. Plant. vol. ii. p. 523.

† Gunnerus (Throndh. Selsk. Skriv. iv. p. 99) styles it *Kobbeherre*—Lord of the Seals.

‡ Nilsson, Skand. Fauna. (Däggdjuren), p. 607.

§ The old Norsemen as they poured forth from Scandinavia on their predatory or colonizing expeditions leavened not only the habits but the language of the conquered. *Marsvin* is the Swedish word for the Porpoise, hence the French *Marsouin* and the same Shetland word. *Nise* is the Norse term for it; hence we have *Nisa* in Greenland and *Neesock* in Shetland (the *ock* being used there, as in many other words, as a diminutive). *Porpoise* is only a corruption of the French *porc poisson*, which we have almost literally translated into *Sea-pig*.

this period. Through the kindness of Hr. Bolbroe, Colonibestyrer of Egedesminde, we obtained the skeleton of a *Nisa*, which had been procured in this vicinity some years ago by his predecessor Hr. Zimmer; but I could see no difference in it, so far as it could be examined in the roughly prepared state, from the one usually found on the British coast. Whether the *Phocæna tuberculifera*, Gray\*, is different from the ordinary Porpoise, I am inclined to doubt. I have examined several Porpoises caught on the British coast, and have invariably found these tubercles on the upper edge of the dorsal fin more or less developed. Independently of this, it is questionable whether such variable characters (and we know that there are many such characters in Cetacea which give no specific distinction) warrant the separation of *Phocæna tuberculifera* from *P. communis*. The flesh of the Porpoise is far from contemptible as an article of food, and is much relished by sailors†.

## 12. BELUGA CATODON (L.), Gray.

Popular names.—*White Whale* (English whalers); *Hvitfisk*, *Hvidfisk* (white fish) (Scandinavian seamen, and Danish colonists in Greenland); *Kelelluak* (Greenlanders and Eskimo generally).

This is, beyond all comparison, so far as its importance to the Greenlanders and Eskimo is concerned, *the* Whale of Greenland. Like the Narwhal it is indigenous, but is only seen on the coast of Danish Greenland during the winter months, leaving the coast south of 72° N. lat. in June, and roaming about at the head of Baffin's Bay and the western shores of Davis Strait during the summer. In October it is seen to go west, not south, but in winter can be seen, in company with the Narwhal, at the broken places in the ice. Its range may be said to be the same as the Narwhal's, and during the summer months corresponds with that of the Right Whale, of which it is looked upon as the precursor. It, however, wanders further south than the Narwhal, being found as a regular denizen as far south as 63° N. lat., though on the opposite coast it reaches much further south, being quite common in the St. Lawrence river. The Greenlanders during the summer kill great numbers of them, and preserve their oil, and dry their flesh for winter use. Of this animal and the Narwhal, about 500 are yearly caught; but the majority of this number consists of the White Whale. It feeds on Crustacea, fish, and Cephalopoda; but in the stomach is generally found some sand. The Greenlanders often jocularly remark, in reference to this, that the *Kelelluak* takes in ballast.

\* Proc. Zool. Soc. 1865, p. 320.

† The flesh of the Porpoise and Grampus was eaten in the fourteenth century in Lent time as fish; and it is lamentable to think how much sin was committed until they were discovered to be mammals. I have heard of the monks of a Carthusian convent roasting an Otter under a similar zoologico-theological error. A MS. in the British Museum (Harl. MSS. no. 279) contains a receipt for making "puddyng of Porpoise;" and we find it served at table as late as the time of Henry VIII., and in Scotland even still later. In the accounts of Holyrood Palace we find frequent entries of monies paid for "Porpess" for the royal table.



Great numbers are caught by means of nets at the entrance of fjords and inlets, or in the sounds between islands. The young are darker-coloured than the adult, and can at once be distinguished among the herds of the ordinary waxy white colour. It is said to be rarely seen far from land. The males and females are together in the drove, and not separate as has been stated. Their blast is not unmusical; and when under the water they emit a peculiar whistling sound which might be mistaken for the whistle of a bird, and on this account the seamen often call them sea-canaries! It is rarely that the whalers kill a white Whale, their swiftness and activity giving them more trouble than the oil is worth\*. They are sometimes also called "Sea-pigs," from their resemblance to that animal when tumbling about in the water.

### 13. MONODON† MONOCEROS, Linn.

(a) Popular names.—*Narwhal*, *Unicorn*, *Unie* (English whalers); *Narhval* (Scandinavians); *Tugalik* (Greenlanders); *Kelelluak-tuak* (Eskimo at Pond's Bay).

(β) *Descriptive remarks*.—The female Narwhal is more spotted than the male. The young is again much darker; and I have seen individuals which were almost white, like the one Anderson describes as having come ashore at the mouth of the Elbe. In a female killed in Pond's Bay, in August 1861, the stomach was corrugated in complicated folds, as were also the small intestines. It contained crustaceans, bones of fish, and an immense quantity of the horny mandibles of some species of Cephalopod (probably *Sepia loligo*) firmly packed one within the other. In its stomach was a long *Lumbricus*-like worm; and the cavities behind the palate were filled with froth and an innumerable number of little worms, such as Scoresby describes in his account of the animal. In some animals which I examined the bone was quite eaten away by them, and that portion of the lining membrane which remained was red or inflamed. There is a curious anastomosis of reticulating arterial blood-vessels inside the lining membrane of the thorax and abdomen and around the spinal cord, which has doubtless a relation to its amphibious life. The blow-holes are placed directly on the top of the head, large, semilunar, opening on either side into two sacs lined with a dark serous membrane, these openings, again, leading to the bronchia and the lungs. The blow-hole has but one opening externally, but about an inch down is divided into two by a cartilaginous septum, continuous a little further down with the bony partition seen in the skull. The rima glottidis is exactly described by the late Prof. Fleming, in the 'Wernerian Trans.' (vol. i. p. 146). The female has no "horns;" but inside the intermaxillary bone are two undeveloped tusks, each about 10 inches long, rough, and with no inclination to a spiral—in fact not unlike a miniature piece of pig-

\* One of the whalers this summer killed several hundreds, but this is an almost isolated case.

† Lamarck subsequently usurped this name for a genus of Pectinobranchiate Mollusca.

iron. On the other hand, the undeveloped tusk in the male is smooth and tapering, and "wrinkled" longitudinally. Double-horned ones are not uncommon; I have seen them swimming about among the herd, and several such skulls have been preserved. Among others, there is a fine specimen, presented by Capt. Graville, in the Trinity House, Hull. One of the teeth is 3 feet long, and the other 4 feet. Of course there is no whalebone in its jaw; but it is interesting to notice the laws of homology of structure (as I think) kept up. On the sides of each gum are transverse markings, either corresponding to the alveoli of the teeth or to the position of the laminae of the whalebone in the *Balænidæ*. The under jaws are very light and quite hollow for half their length, as in most species of *Cetacea*; this cavity is filled with a very fine blubber. The *tongue* is regularly concentrically grooved and attached its whole length, so as scarcely to be recognized as it lies flat on the base of the mouth; the roof of the mouth is correspondingly marked. The *lungs* are each about  $1\frac{1}{2}$  foot long; the *kidney* 9 inches long and about  $4\frac{1}{2}$  inches broad; the *lacteals* were very distinct and distended; the large intestine at broadest about 4 inches in diameter, at thinnest about  $1\frac{1}{2}$  inch, and about 60 feet in length.

The *pectoral fin* is not notched below (as would seem from the plate in Hamilton's book "On Whales"), but smooth and entire, curved below, the greatest curve pointing posteriorly, but with the thickest part of the fin anteriorly. The animal was greyish or velvet-black, with white spots, sometimes roundish, but more frequently irregular blotches of no certain outline running into one another. There were no spots on the tail or fin; waxy-looking streaks shaded off on each side of the indentation of the tail, which is white at the line of indentation. The *ridge* along its back corresponding to the dorsal fin is of a uniform height of 1 inch throughout, irregularly notched on the top, like the embrasures of a castle-wall, and is formed of blubber covered with the common integument of the body, of which it is merely a raised fold.

( $\gamma$ ) *Habits &c.*—The Narwhal is gregarious, generally travelling in great herds. I have seen a herd of many thousands travelling north on their summer migrations, tusk to tusk and tail to tail, like a regiment of cavalry, so regularly did they seem to rise and sink into the water in their undulatory movements in swimming. It is very active and will often dive with the rapidity of the *B. mysticetes*, taking out 30 or 40 fathoms of line. These "schools" are not all of one sex, as stated by Scoresby, but males and females mixed. It copulates in an upright position, and seems to produce at about the same time as the Right Whale. The use of the tusk has long been a matter of dispute: it has been supposed to use it to stir up its food from the bottom; but in such a case the female would be sadly at a loss. They seem to fight with them; for it is rarely that an unbroken one is got, and occasionally one may be found with the point of another jammed into the broken place where the tusk is young enough to be hollow or is broken near enough to the skull. Fabricius thought that it was to keep the holes open in the ice during the

winter; and the following occurrence seems to support this view. In April, 1860, a Greenlander was travelling along the ice in the vicinity of Christianshaab, and discovered one of these open spaces in the ice, which, even in the most severe winters, remain open. In this hole hundreds of Narwhals and white Whales were protruding their heads to breathe, no other place presenting itself for miles around. It was described to me as akin to an Arctic Black Hole of Calcutta, in the eagerness of the animals to keep at the place. Hundreds of Eskimo and Danes resorted thither with their dogs and sledges, and while one shot the animal, another harpooned it to prevent its being pushed aside by the anxious crowd of breathers. Dozens of both Narwhals and white Whales were killed, but many were lost before they were got home, the ice breaking up soon after. In the ensuing summer the natives found many washed up in the bays and inlets around. Fabricius describes a similar scene. Neither the Narwhal nor the White Whale are timid animals, but will approach close to, and gambol for hours in the immediate vicinity of, the ship.

(δ) *Geographical distribution*.—The range and migration of the Narwhal is much the same as that of the White Whale. It is only found on the coast of Danish Greenland during the spring and winter, migrating northward and westward in the summer. It is rarely seen south of 65° N. lat.

(ε) *Economic value*.—In early times the tusk of the Narwhal was highly valued as a medicine; and Master Pomet, in his 'Compleat Historie of Drugges,' gives special directions regarding the selection of them. To this day the Chinese esteem them for their medicinal properties. In 1861 the price of Narwhals' ivory was 1s. 6d. per lb., but of late years it has risen prodigiously in value, but is again falling. In the Palace of Rosenborg is a throne of the kings of Denmark manufactured of this ivory; and Capt. Scoresby (the father of the Doctor) had a bed made of them. The oil is highly esteemed, and the flesh is very palatable. The skin of the Narwhal boiled to a jelly is looked upon, and justly so, as one of the prime dainties of a Greenlander. The hospitable Danish ladies resident in that country always make a point of presenting a dish of *mattak* to their foreign visitors, who soon begin to like it.

#### 14. *GLOBIOCEPHALUS SVINEVAL* (Lacép.), Gray.

*Delphinus melas*, Traill, Nicholson's Journal, vol. xxii. (1809) p. 21.

*Delphinus deductor*, Traill, MSS. and Scoresby's Arctic Regions, vol. i. p. 496, t. 13. fig. 1.

*Delphinus globiceps*, Cuv. Ann. Mus. xix. t. 1. fig. 2.

*Delphinus tursio*, O. Fabr. Faun. Grænl. p. 49. no. 31.

Popular names.—*Bottle-nose*, *Caaing Whale* (fishermen and seamen); *Grindaquealur* (Faroe Islands); *Grinde-Hval* (Swedish and Danish); *Nesernak* or *Nisarnak* (Greenland). The term Bottle-nose is applied by sailors to several species of Whales. In fact any

Whale which is not a "Right Whale," "finner," "parmacity" (spermaceti), "purpess," "unicorn" (Narwhal), or "White Whale" is with them included under the vague term of "Bottle-nose." The common and most characteristic name for this Whale is that used in the north of Scotland, viz. caaing or driving Whale—a term translated into *deductor*\*.

There seems little doubt that this is the *Delphinus tursio* of Fabricius, as the Eskimo name *Nesernak* is applied to the present animal. If so, Fabricius's name has the priority; but as it has been confounded with another species it is better to keep Lacépède's most barbarous trivial name. Gray and other authors look upon Fabricius's *Nesernak* as the type of a distinct species, and have described it as *Tursio truncatus*. The *Delphinus truncatus* of Montagu (Wernerian Society's Trans. vol. iii. t. 5. fig. 3) is a totally different animal. Fabricius's description ("Frons rotunda, declivis s. sursum repanda, desinens rostro attenuatiore; sic fronti anatis mollissimæ, non absimilis"), though seemingly contradictory of the identity of the *Globocephalus vineval* and *Delphinus tursio* of O. Fabr., must in reality be received for no more than it is worth, Cetological critics have received the descriptions of Fabricius as if they were infallible or superior to those of any other author who has succeeded him. We know that many of his descriptions of other animals which are well known were erroneous, and that few of those regarding which there could be no mistake were altogether free from error; therefore I cannot see why we should receive the others otherwise than as approximately correct. Fabricius enjoyed during the few years he passed in Greenland no better opportunities than any other naturalist in that country at the present day. Many of the animals which he describes are very rarely killed or seen by the natives; and many of his descriptions bear on the face of them the marks of having been derived from the natives' narration, and not from actual specimens. Any one who has examined such unwieldy animals as the Cetacea must know how difficult it is, even under the most favourable circumstances, to arrive at anything like an accurate idea of the animal the external appearance of which we may be desirous of describing. Therefore, as the Greenlanders call this animal *Nesernak*, as the description does not widely differ from the appearance of the Caaing Whale, and as Montagu's *Delphinus truncatus*, with which it has been supposed to be synonymous, has never been found in Davis Strait, while the present species has, we are warranted in concluding with Dr. Reinhardt that the synonymy given under this species is correct.

This Whale is not a regular visitor of Davis Strait or Baffin's Bay, but is occasionally to be seen in droves in the summer time along the whole coast of Danish Greenland. An excellent account of this species is given by Turner M'Bain, derived from the exami-

\* It has no connexion with *calling*, as it has sometimes been translated even in works written by Scotchmen. It is derived from the Scotch word *caa*, signifying to drive, relating to their ordinary method of capture, viz. by driving them ashore.



nation of some individuals of a drove which came into the Frith of Forth in the spring of 1867 (Journ. Anat. and Phys. 1867, and Proc. Roy. Phys. Soc. Edin. 1866-67 ined.)\*.

### 15. HYPEROODON BUTZKOF, Lacép.

*Monodon spurius*, O. Fab. Faun. Grœnl. p. 31. no. 19.

*Chœnocetus rostratus* (Müll.), Eschr. Undersøg. over Hvaldyr. 4<sup>de</sup> Afh. 1845; Reinhardt, Tillæg til en Beskrevet af Grønland (Rink), p. 11.

Popular names.—*Bottle-nose* or *Bottlie* (English whalers); *Nabbhvål* (Scandinavians); *Andarnefa* (Icelanders); *Dögling* (Faroe-islanders); *Anarnak* (Greenlanders).

This is undoubtedly the *Monodon spurius* of Fabricius, that author having made the not uncommon mistake of describing the upper for the lower jaw. As it is a rare animal on the Greenland coast, Fabricius could have been but little acquainted with it. The Whale is only seen about the mouth of Davis Strait, swimming in threes or fours; it is occasionally captured by them, as one will yield as much oil as a Narwhal. One ship's crew some years ago killed fifteen of them, and the oil was represented to me as mixing well with spermaceti, and selling for the same price, viz. 10s. 6d. per gallon.

### 16. HYPEROODON LATIFRONS, Gray.

*Lagenocetus latifrons*, Gray, Proc. Zool. Soc. 1864, p. 241.

This species is known from skulls and skeletons from various museums, and as an Arctic animal from a skull brought from "Greenland" by Capt. Wareham, and now in the Newcastle Museum. Greenland, however, is a loose term; but from what I have said as to the range and habits of *H. butzkof*, we may safely conclude that it was obtained in Davis Strait. I am not aware that we have any external characters to separate it from the preceding, but yet the apparently constant distinction presented by the skull would lead us to believe in its distinctness. Therefore, though we may not go so far as Eschricht in believing it to be the male of *H. butzkof*, yet we must hesitate before joining in the opinion of even such an experienced zoologist as Dr. Gray as to its claim to generic rank.

\* In the Society's 'Proceedings' for 1853, p. 103, there is a notice of a paper "On the Capture of *Delphinus orca* in South Greenland," by M. Rehüller, in which it is said that the number taken at Westmanhavn since 1843 was 2200, whereas between 1819 and 1843 there were only 280. This additional capture, amounting in the aggregate to the value of £4000 sterling, was described as being due to the introduction of nets. Now there is no such place as "Westmanhavn" in Greenland, and I question if 2260 *Orcas* have ever been killed in Greenland since the beginning of time. Apparently the notice refers to the capture of *Globocephalus* in the Faroe Islands.

2. On *Pachybatrachus robustus*, a New Genus of Anurous Batrachians. By ST. GEORGE MIVART, F.L.S., Lecturer on Comparative Anatomy at St. Mary's Hospital.

In examining at the British Museum the Anurous Batrachians of my own collection, in order to name them correctly, I discovered that the specimen here described was of a kind not present in the collection, that it was also of a kind unknown to Dr. Günther, and, finally, that, as I believe, the form is hitherto undescribed.

It appears to me to constitute a new genus, for which I propose the name *Pachybatrachus*, and *robustus* as its specific appellation.

According to the system of classification devised by Dr. Günther it must be placed in his *Ranidæ*, where its cleft tongue, webbed toes, and edentulous palate and normally placed digits approximate it to *Dicroglossus* and *Phrynobatrachus*. It differs from both these genera, however, in its very different habit, its larger size, relatively as well as absolutely much larger and broader head and mouth, its smooth skin and large tympanum. Its toes are less completely and largely webbed than in *Dicroglossus*, while they are more so than is the case in *Phrynobatrachus*.

The head of *Pachybatrachus robustus* is very large and broad; the snout is somewhat longer than the eye; the canthus rostralis is not much marked; the anterior end of the muzzle is rounded but not insignificant in vertical extent, and the loreal region is nearly vertical. The eye is rather large, and the upper eyelid is so marked transversely as at first to have somewhat the appearance of being free and notched behind, as in *Megalixalus*\*; but it is really entire, and is not furnished with any process. The tympanum is very large, its transverse diameter nearly equalling that of the aperture of the eye. The crown of the head is nearly flat. When the head is looked at from below, the upper jaw is seen to project forwards somewhat beyond the anterior extremity of the mandible; and the two rami of the latter diverge at an angle of about 60°.

There is a slight symphysial tubercle, but the outer margin of each of the notches which define it can hardly be said to rise into a distinct apophysis.

The external nostrils are moderate and situated at about the posterior end of the anterior third of a line drawn from the end of the snout to the anterior end of the eye.

There are no teeth in the lower jaw; but a range of small teeth runs along the maxillary border. The palate is absolutely edentulous. The choanæ are rather large, and the openings of the eustachian tubes are of nearly the same dimensions.

The tongue is well developed, and nearly its hinder half is free; it is distinctly notched, or rather the fleshy processes project from its hinder margin, each about 0.1 inch in length. There is no fold beneath the throat or across the chest; but a prominent line (a glaudular fold) extends backwards, from the hinder angle of the eye-

\* Dr. Günther, Proc. Zool. Soc. 1868, p. 485.

aperture, immediately above the tympanum; there it bifurcates, one branch descending obliquely downwards and backwards behind the tympanum to the root of the pectoral limb, the other branch passing backwards along the whole length of the side of the back to the lateral margin of the anus.



A. *Pachybatrachus robustus*, nat. size. B. Interior of mouth of ditto.

All the digits of both limbs have their extremities somewhat enlarged, and there are subarticular tubercles. The fingers are very well developed and quite free. They are normally disposed, neither the first two nor the first alone being opposite the others; the third is the longest, then the first and fourth, which are of nearly the same length; the second finger is the shortest. When the limb is turned backwards the longest digit attains the posterior margin of the middle of the body. There is a considerable prominence on the palm at

the root of the first finger. The pelvic limb, though elongated, as in all Frogs of ranoid habit, is yet remarkable for its short tarsus, which does not quite equal half the length of the tibia.

The toes are well webbed, the membrane extending nearly to the ends of the digits, but nevertheless being strongly emarginated. There is no shovel, but a very small yet distinct tubercle at the base of the first toe, and a scarcely noticeable rudiment of a second tubercle at the base of the fourth toe. There are no other tarsal tubercles whatever. The skin over the whole body is smooth, with numerous flat warts on the undersides of the thighs. The cephalic derm is not ossified. The colour of the specimen is now dark brown above, lighter beneath. A black line extends along each side of the back from the eye to the anus; and there are black markings on the limbs, and indications of spots in the middle of the back. Unfortunately, I have no knowledge from what part of the world the individual here described was obtained.

	inches.
Extreme length from end of snout to anus . . . . .	2·45
Length from end of muzzle to anterior angle of eye . . . .	·38
Breadth between the eyes (their anterior angles) . . . . .	·53
Length of the aperture of the eye . . . . .	·30
Antero-posterior diameter of the tympanum . . . . .	·27
Vertical diameter of the tympanum . . . . .	·27
Breadth between the two posterior angles of the mouth .	·96
Length from symphysis to mid point between said angles	·79
—— from shoulder to elbow . . . . .	·47
—— from elbow to carpus . . . . .	·58
Extreme length of pectoral limb . . . . .	1·58
Length of first digit . . . . .	·35
—— of second digit . . . . .	·27
—— of third digit . . . . .	·48
—— of fourth digit . . . . .	·32
—— from groin to knee . . . . .	·96
—— of tibia . . . . .	1·10
—— of tarsus . . . . .	·53
—— of first toe . . . . .	·22
—— of second toe . . . . .	·30
—— of third toe . . . . .	·50
—— of fourth toe . . . . .	·74
—— of fifth toe . . . . .	·47

The generic and specific characters will be as follows:—

PACHYBATRACHUS, g. n. RANIDARUM.

No digital disks; maxillary teeth, but no vomerine teeth; sacral vertebra not dilated; no parotoids or lumbar glands, but a glandular fold on each side of the body; fingers quite free, and normally disposed; toes webbed; one small tarsal tubercle at base of first toe, and a minute rudiment at the base of fourth toe; tarsus less than half the length of tibia; tongue deeply notched, and free behind;



tympanum very large, but not very distinct; eustachian tubes moderate.

*PACHYBATRACHUS ROBUSTUS.*

Head large and broad, snout slightly longer than the eye, and the loreal region nearly vertical. Eye large, tympanum very large. Digits with their extremities rounded and with subarticular tubercles. Skin entirely smooth. A glandular fold extending from the eye to the anus, and sending down a branch behind the tympanum. Upper parts dark brown; glandular fold, tarsus, tibia, arm, and middle of back with black markings. Under parts lighter, and free from black markings. Transverse light markings on the hinder part of each upper eyelid.

The typical specimen has been deposited in the national collection.

3. Note on the Bottlenosed Whales (*Tursio*).

By Dr. J. E. GRAY, F.R.S., V.P.Z.S., &c.

A short time ago the British Museum received three skeletons and a skull of the Bottlenosed Dolphin (*Tursio truncatus*), which were obtained from one school by Edward Gerrard, jun., in the Firth of Forth. They show the very great change that takes place in the form of the skull, and especially of the beak, during the growth of the animal.

The beak of the skull of the young animal is regular, conical, tapering and contracted in front. The skull is  $17\frac{1}{2}$  inches long, with the beak, from the notch,  $9\frac{1}{2}$  inches, and the teeth-line, by the callipers, 8 inches. The teeth are small, conical, acute, three and one-half in an inch.

The skull of a full-grown female is similar but larger than that of the young animal.

There is another skull of a full-grown animal of the same school, but its sex was not determined. It is very like that of the female, but rather larger.

The skull of the very old male animal (fig. 1, p. 561) is much thickened; but the great peculiarity is that the beak is broad and flattened, and very much expanded, flattened, and curved up at the tip in front, and as if part of the beak in front had been absorbed. The teeth have nearly all fallen out, and there is only one left, which is spread out towards the edges and flattened, and evidently would have fallen out in a very short time. The intermaxillary and palatine bones are visible nearly to the back part of the palate of the beak. The length of the skull is  $20\frac{1}{2}$  inches, of the beak, from the notch,  $11\frac{1}{2}$ , of the teeth-line  $9\frac{1}{2}$ . Width of the brain-case at eyebrows  $11\frac{1}{2}$ , of beak at notch 6, in middle (or tenth tooth)  $4\frac{1}{4}$ .

There is a considerable difference in the form of the pterygoid bones and of the sheath of the hinder nasal opening in these four

Fig. 1.

Fig. 1. Skull of *Trusio truncatus* ( $\delta$ ), adult.

Fig. 2.

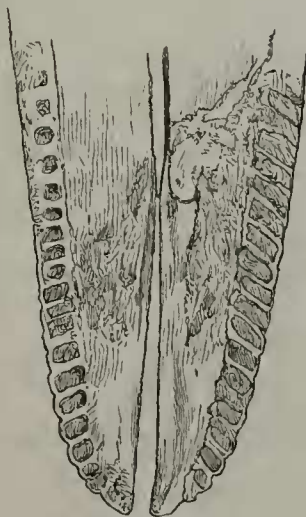


Fig. 2. Under surface of the upper jaw, showing the worn surface.

specimens, all obtained at the same time from the same school of these Dolphins from the Firth of Forth.

In the skull of the old male the sheath of the opening is nearly flat below and on the sides, the lateral ridges being almost on the edge.

In the skull of the full-grown female the sheath of the hinder nasal opening is nearly similar to that of the male, but the sides are more convex and swollen.

The third skull of a full-grown animal, the sex of which was not marked, is very like the skull in the British Museum that Colonel Montagu described as *Delphinus truncatus*, and it has, like the latter, all the teeth much worn down and truncated. They both differ from the skull of the adult male and of the full-grown female in the sheath of the hinder nasal aperture being rather narrower, more deeply impressed in the centre, and in the lateral keel being more within the margin, making the side of the sheath more convex and rounded.

Being very desirous of obtaining information bearing on the geographical distribution of Cetacea, and hearing that Mr. Moore, of the Liverpool Museum, had recently obtained the skull of a Bottlenosed Whale (*Tursio*) from the west coast of Africa, I requested him to send it to the British Museum for examination and comparison. It is intermediate, in some respects, between the skulls of the *Tursio truncatus*, of the English coast, and *T. metis*, the locality of which is unknown. It has the large teeth and long teeth-line of the *T. truncatus*; indeed the teeth-line is above half an inch longer than in that species; but the beak of the skull is rather slender: in this latter character it is more like *T. metis*; but that species has a rather shorter teeth-line even than *T. truncatus*.

If it were not that I have lately observed that Dolphins that differ very little from each other in the form and proportion of their skulls have very different external characters, I should be inclined to think that *T. truncatus*, *T. metis*, and the specimen from West Africa were all of one species, varying a little in the form of the skull; but we must leave this question for further examination, more especially as different authors have described the living *Tursio* that came under their examination as being very differently coloured externally, and only record that a species of *Tursio* is found on the west coast of Africa, as well as in the North Sea, the Bay of Biscay, the Mediterranean, and the Red Sea.

The following are the measurements of the West-African skull:—

	inches.
Length entire . . . . .	22 $\frac{1}{4}$
—— of beak . . . . .	13
—— of teeth-line . . . . .	11
Width of brain-case . . . . .	10 $\frac{1}{2}$
—— of beak at notch . . . . .	5 $\frac{7}{12}$
—— of beak between tenth and eleventh tooth . .	3 $\frac{1}{12}$

The skull was presented to the Liverpool Museum by Mr. J. Lewis Ingram, of the Temple, who obtained it at the Gambia.





2.

1.



3.